## Operations N3 Data Ingest

### *January 2012*

## LT Stan Rogers
### FNMOC Operations
### Fleet Liaison Officer

# *Team Function*

The Data Ingest Team implements, evaluates, maintains and improves:

(1) Decoding and quality control systems for both conventional and satellite remotely-sensed METOC data

(2)  Software systems to manage both real-time and historical METOC model output and observational data, and provide these products in standard formats for transmission to external customers.

(3)  Interagency coordination and support among the nations OPC's (COPC, CSAB, ODAA, CCM, OCM)

The Data Ingest Team will understand the flow of data and their associated functionalities through out the enterprise from ingest to distribution.
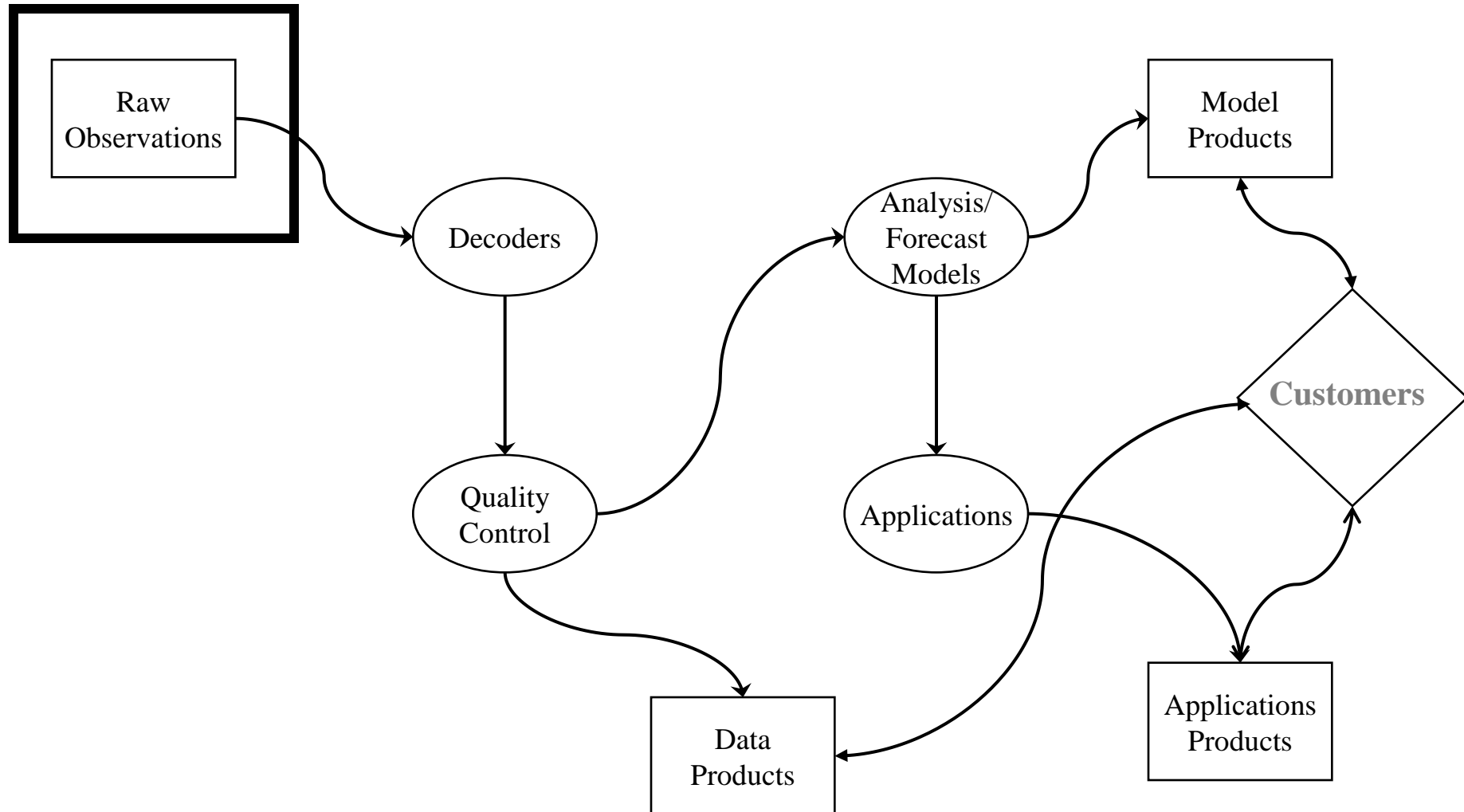
1.   Data Ingest
     a.  Conventional observation new data types
     b.  Satellite new data types

2.   Quality Control and Data Preparation (QC)
     a. ATMOSPHERIC (TRANSMET and SAT_FGGE)
     b. OCEANOGRAPHIC (NCODA)

3.   Satellite Data Processing
     a.  Radiances, retrievals, profiles, and feature track winds for NWP
     b.  Tactical imagery – Sat_focus
     c.  Tropical Cyclone tracking - TCWEB

4.   Interagency Support
     a.  Committee Operational Processing Centers (COPC)
     b.  Cooperative Support and Backup (CSAB)
     c.  Joint Action Groups (JAGS) -  Acquisition/Assimilation, Communications, Modeling
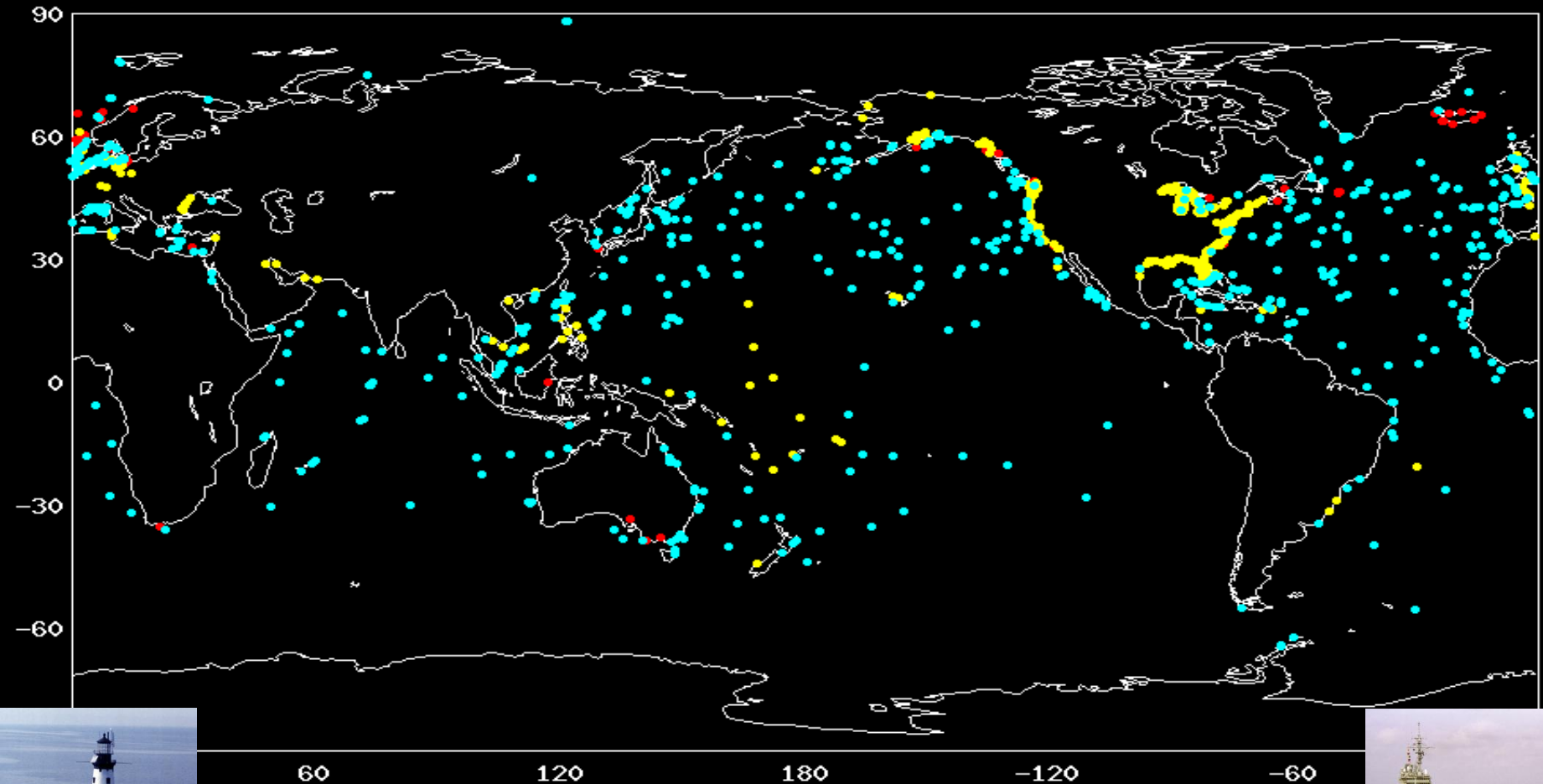
# METOC Data Flow

Raw
Observations

Decoders

Quality
Control

Analysis/
Forecast
Models

Model
Products

Applications

Customers

Data
Products

Applications
Products

# *Ship  Weather Reports*

# *Buoy Observations*



Buoy Coverage
2007050100   late

| Fixed | | Drifting | |
|---|---|---|---|
| count ------- | 2178 | count ------- | 8114 |
| locations --- | 433 | locations --- | 4366 |
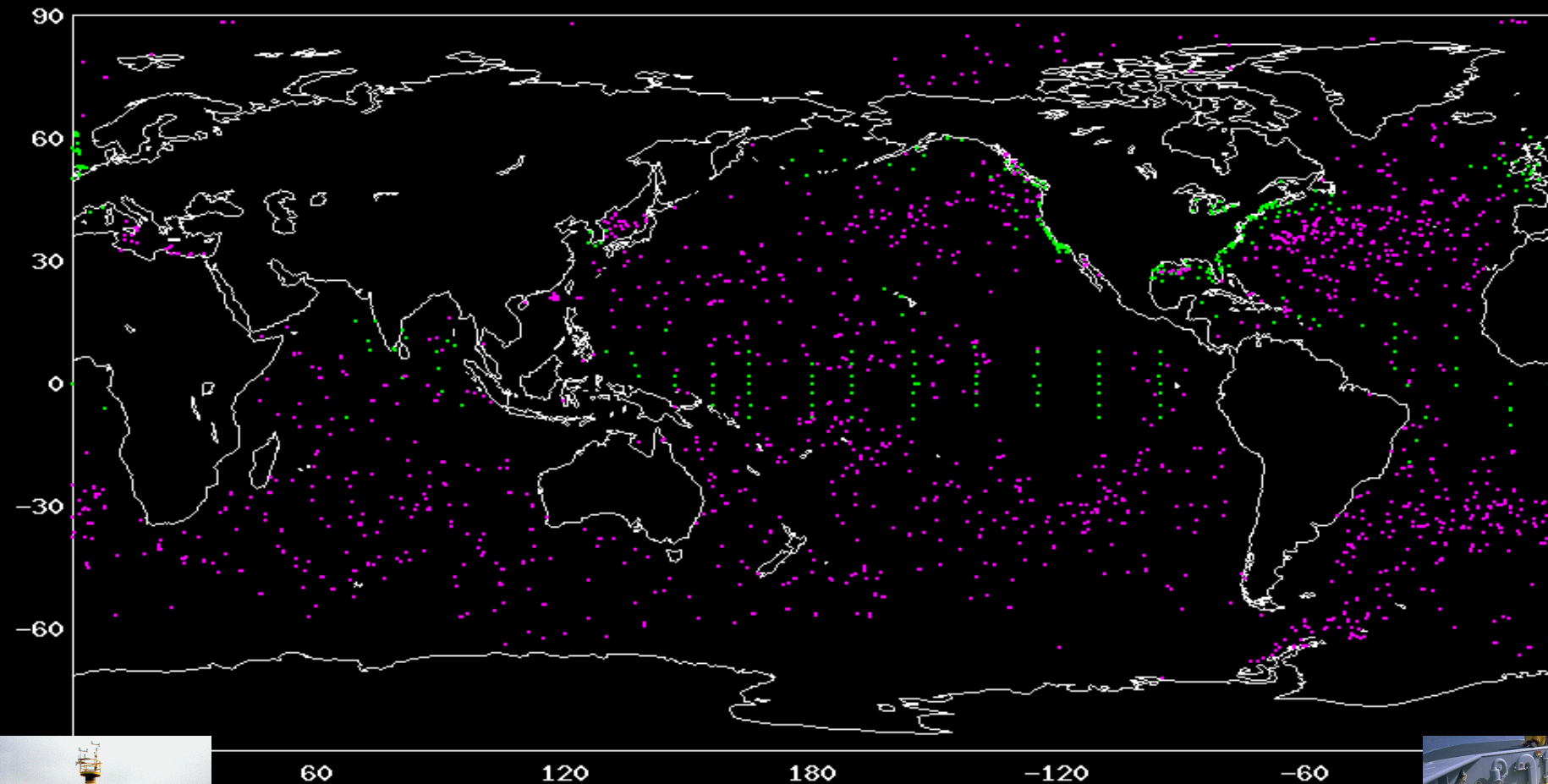
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# *RADIOSONDE Observations*



Raob Coverage
2007050100   late

| Dropsonde | | Ship | | Land | | 75% Land, past 30 days | |
|---|---|---|---|---|---|---|---|
| count ------- | 0 | count ------- | 6 | count ------- | 618 | count ------- | 588 |
| locations --- | 0 | locations --- | 6 | locations --- | 613 | locations --- | 588 |
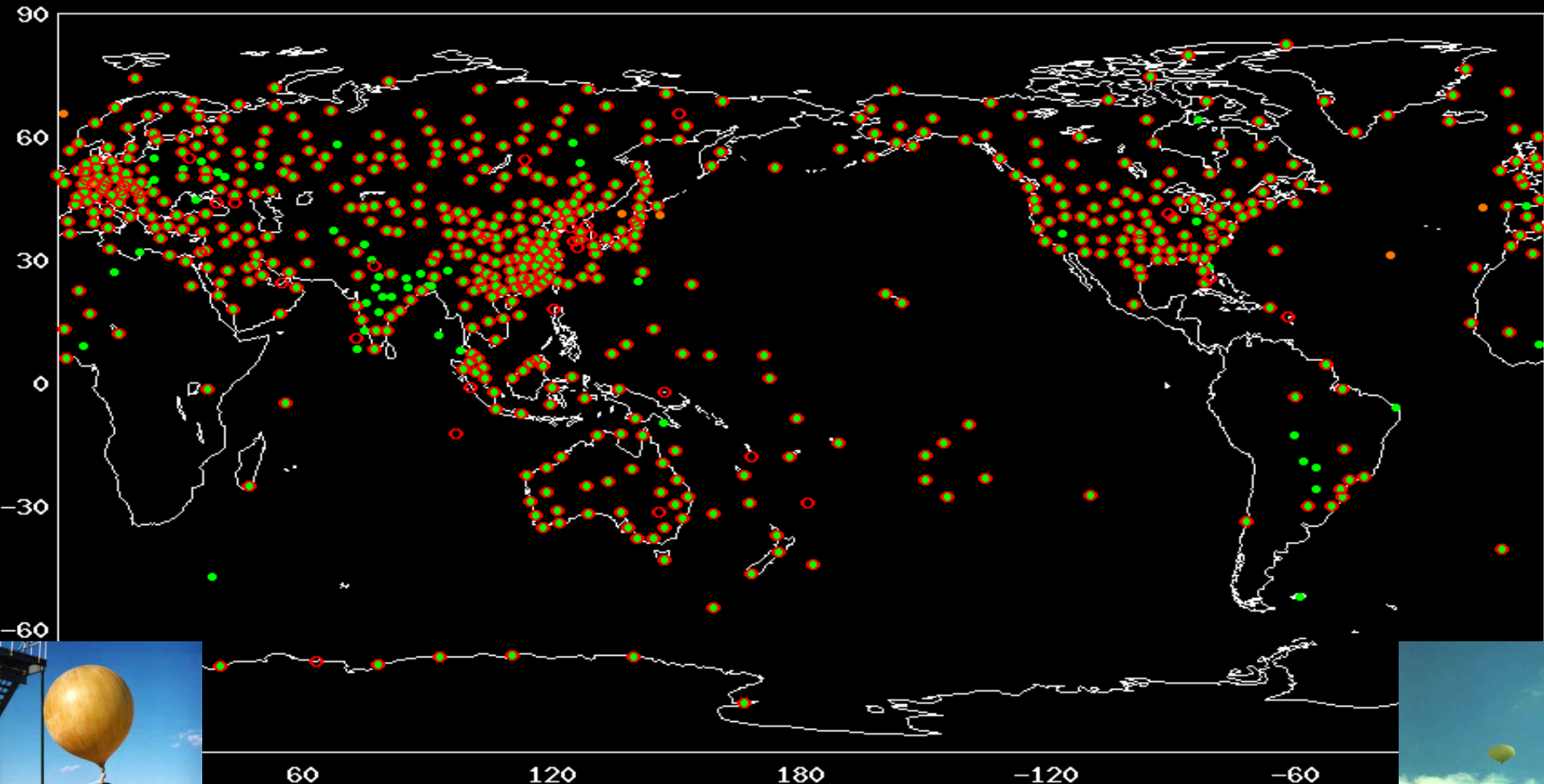
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# *AIRCRAFT   Reports*



AMDAR Coverage
2007050100   late

| AMDAR | | German AMDAR | | Canadian AMDAR | |
|---|---|---|---|---|---|
| count ------- | 9234 | count ------- | 2923 | count ------- | 11459 |
| locations --- | 8107 | locations --- | 2733 | locations --- | 9925 |
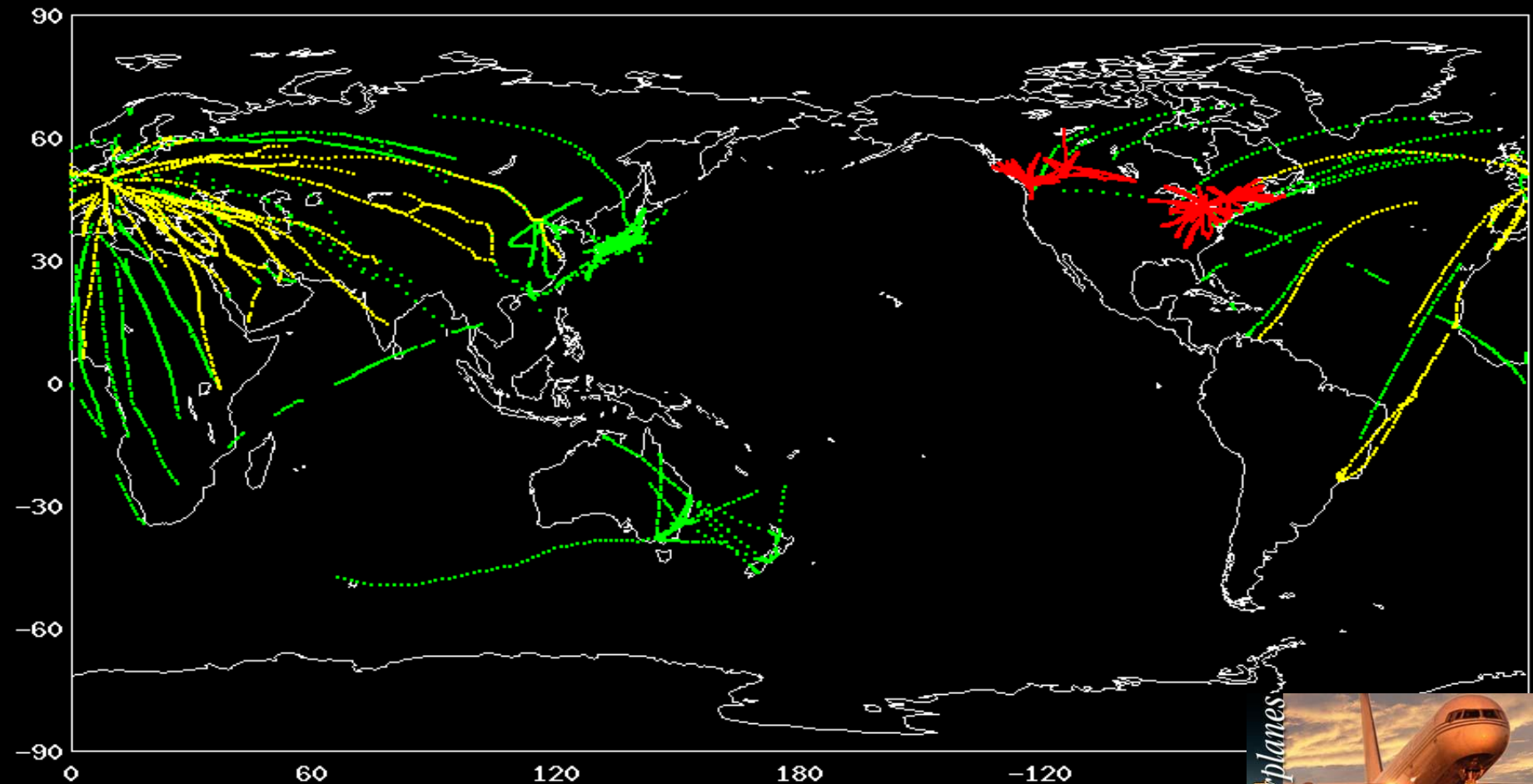
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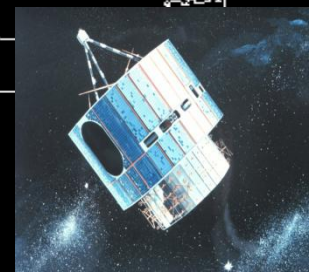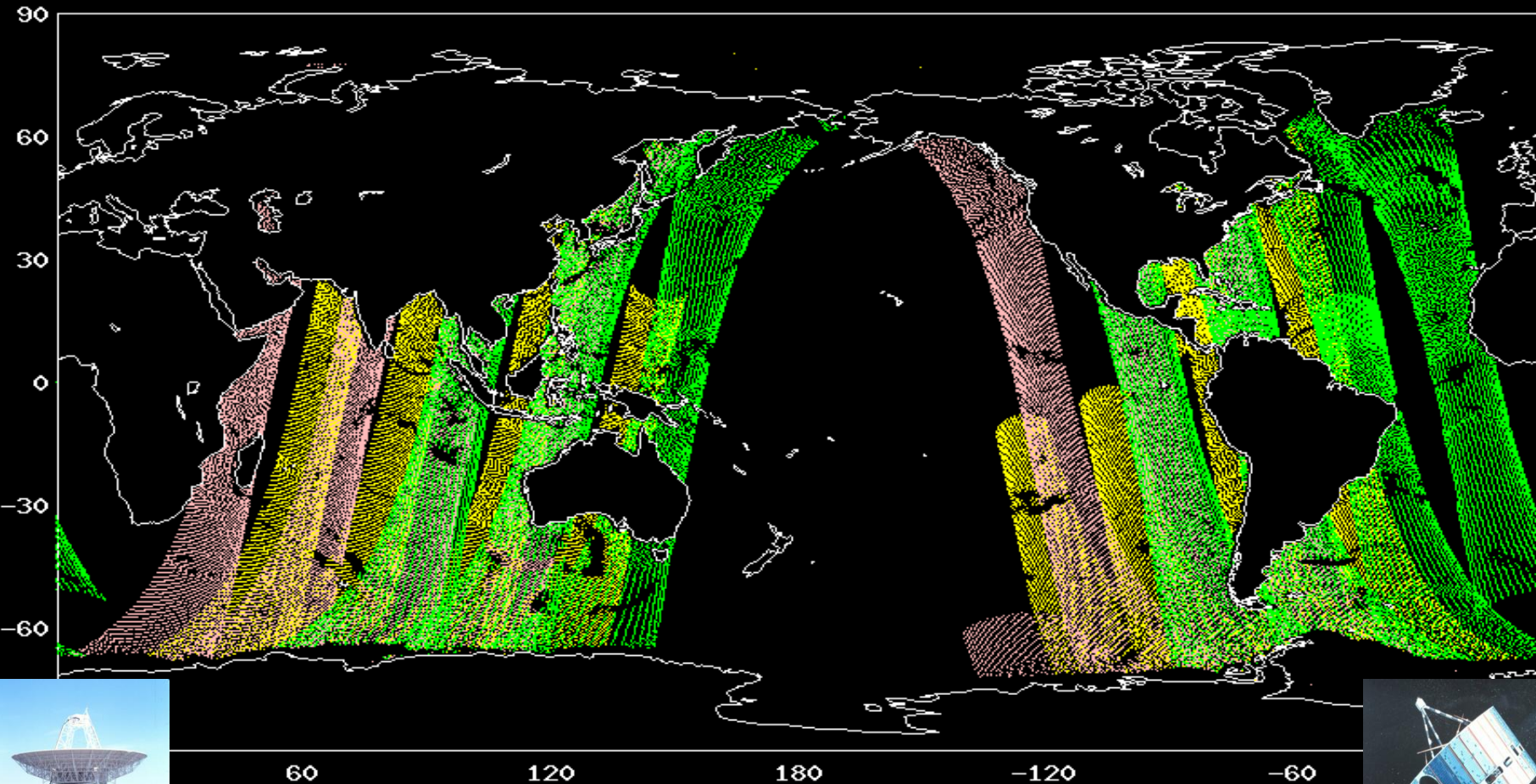
# SATELLITE Water Vapor, Wind Speed, Rain Rate



SSM/I Coverage
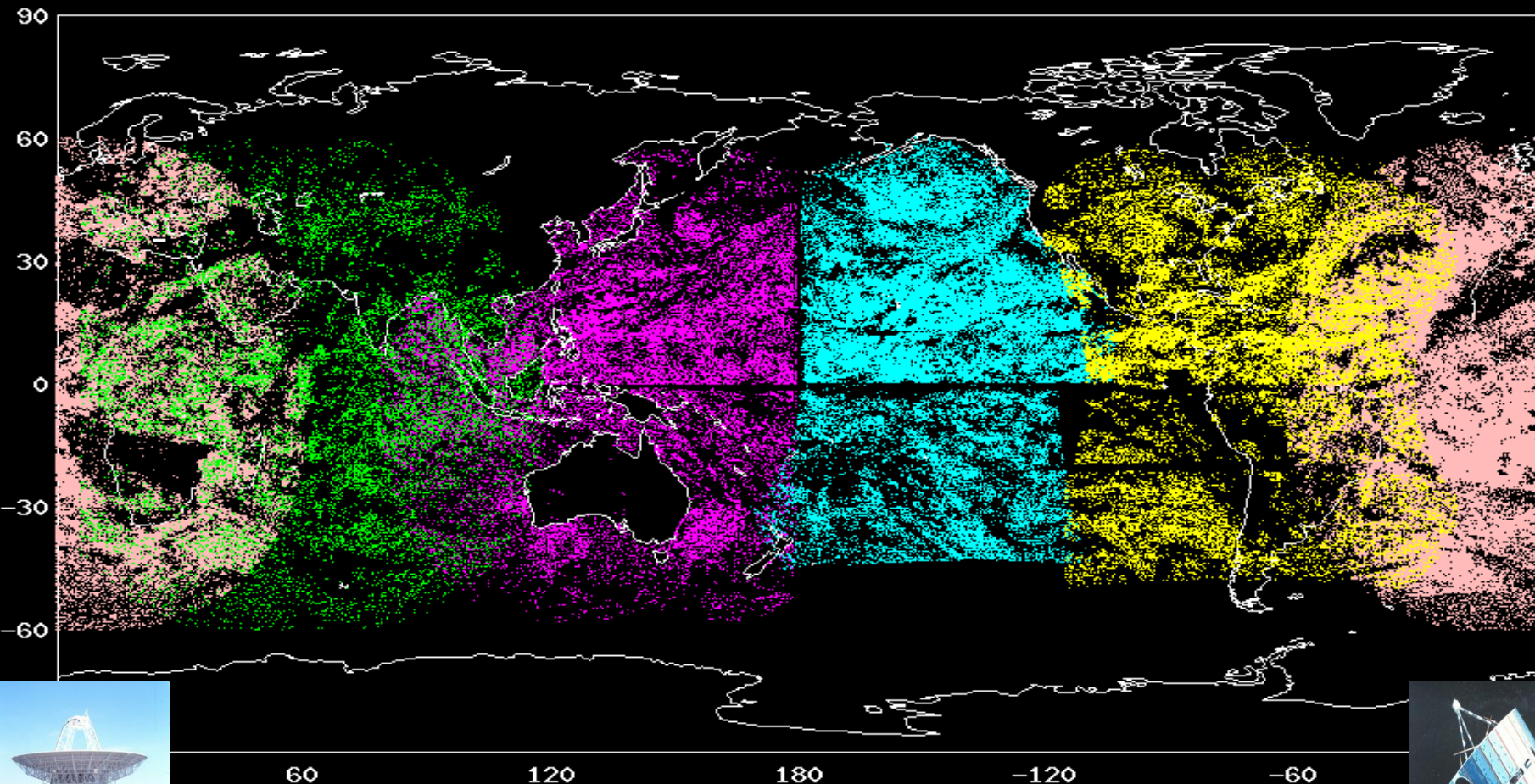2007050100   late

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# *SATELLITE WINDS*

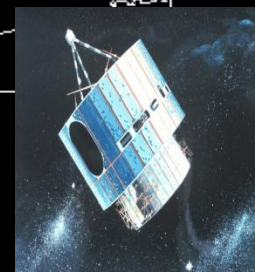

CIMSS/Univ. of Wis., Satellite Feature Tracked Winds Coverage
2007050100    late

| METEOSAT 9 | | METEOSAT 7 | | MTSAT-1R | | GOES-11 | | GOES-12 | |
|---|---|---|---|---|---|---|---|---|---|
| count ------- | 93287 | count ------- | 16836 | count ------- | 21240 | count ------- | 44935 | count ------- | 32600 |
| locations --- | 89995 | locations --- | 16397 | locations --- | 20677 | locations --- | 44011 | locations --- | 29720 |

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# *Working On*

- Conventional Observations New Data Types

    - UAVs/GLIDERS -  (Unmanned Arial/Oceanographic Vehicles) - NAVO

    - Navy ACARS  -  (Aircraft Communications Addressing and Reporting System for Aircraft Meteorological Data Relay for P-8A MMA) - NAVAIR

    - European AMDARS  - Aircraft Meteorological Data Relay System - AFWA

    - J-OBS  -  (Joint Observations Submission) – web based

    - RRS  -  (Radiosonde Replacement System) GPS based - NWS TOC

    - NSW Directorate  Iridium Wave Buoys/Atmospheric Sensors - CNMOC
    - Weather Extractor Computer -  LBSF&I  Volumetric Radar  scans from the SHIP to SHORE - Communication SFTP IA constraints - SPAWAR
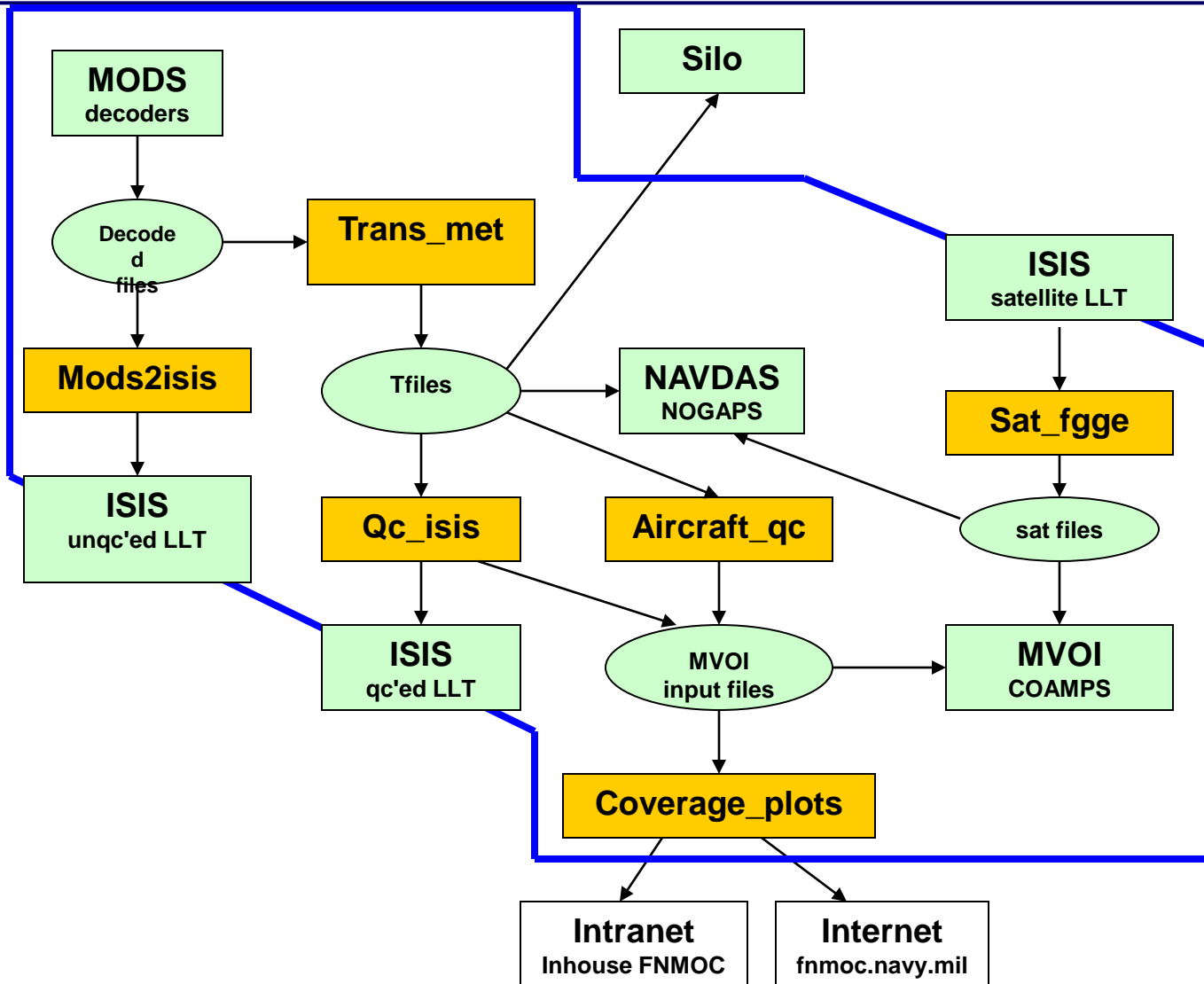
# METOC Data Flow
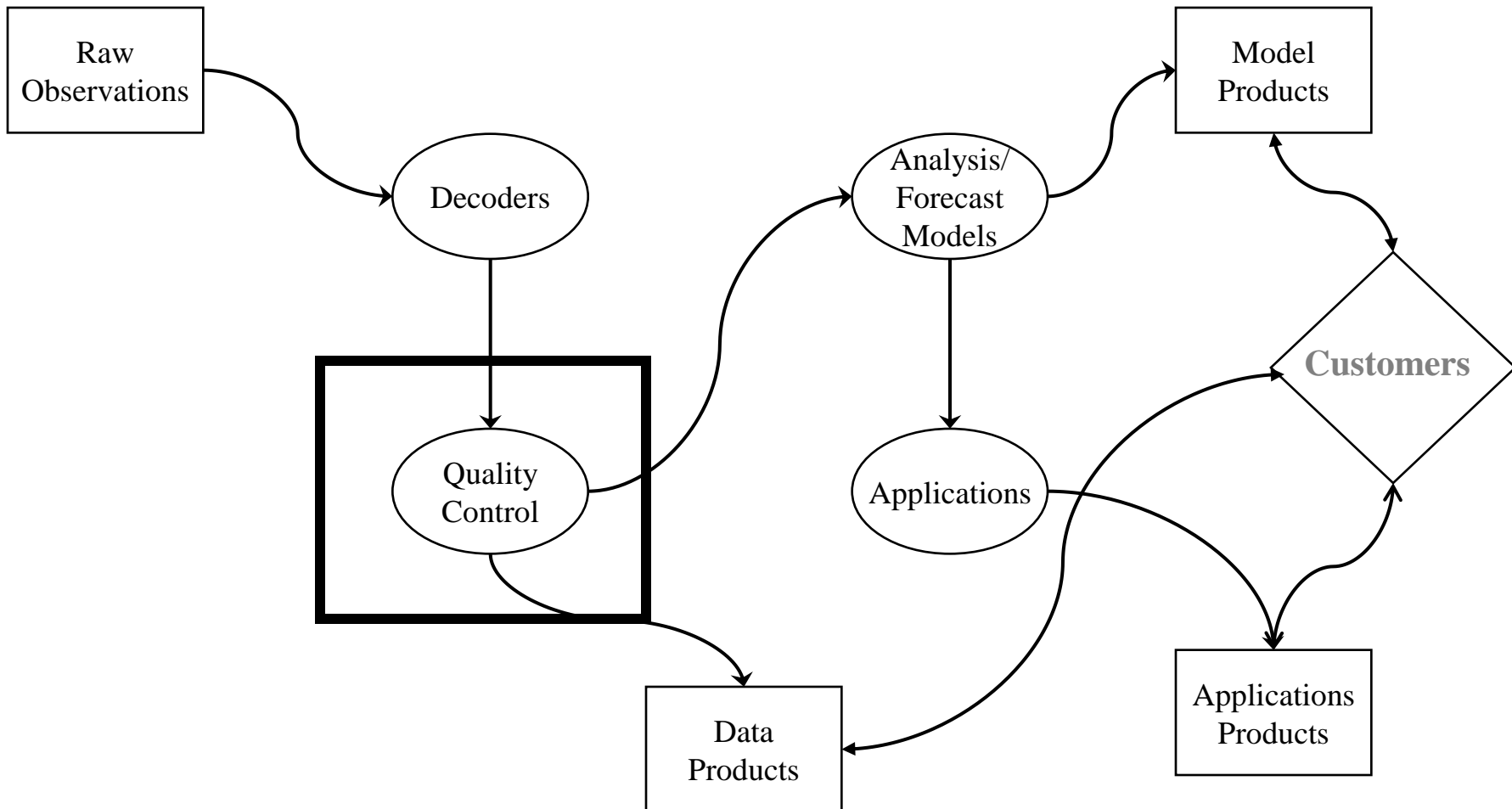
# MET_QC Including Model Ingest

# NCODA Features

## Analysis Features

- 34 levels (surface – 5000 m depth)
- Varying configurations (grid domain/resolution)
- 12 and 24 hours Ops cycle frequency

## NCODA Products:

- Surface boundary conditions for NOGAPS and COAMPS.
- ¼° analysis provided to AFWA
- Ice concentration analyses provided to National Ice Patrol.
- The 3-D fields are used by TOPS, WebSAR, and the GFDN applications.
- Basis for ASW products for NAVO backup capability if needed.
- Significant Wave Height Analysis, 3QFY09 ops
- Scheduled upgrades:
  - First guess for WW3 (coupled), awaiting AMOP approval 4QFY09

07 Sept 2006 SST Analysis



FNMOC Hi-Res NCODA: SST Analysis (C)    07 Sep 2006 12Z
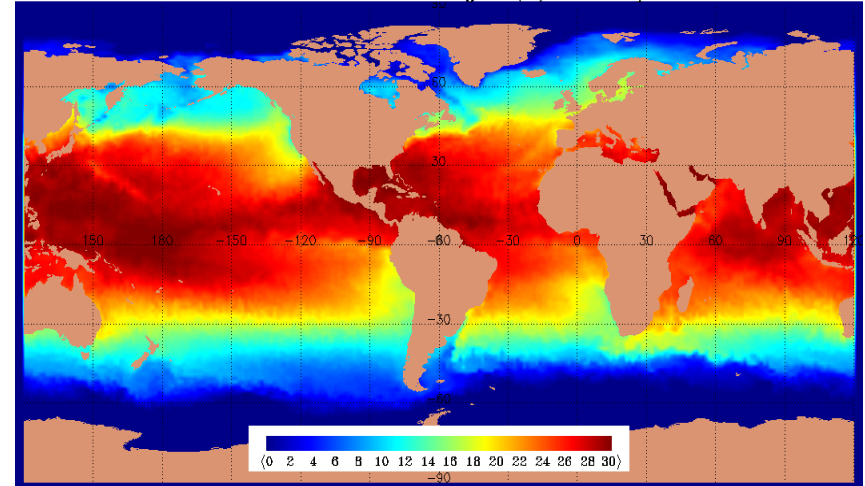


FNMOC Hi-Res NCODA: SST-Climate Anomaly (C)    07 Sep 2006 12Z

07 Sept 2006 SST Anomalies
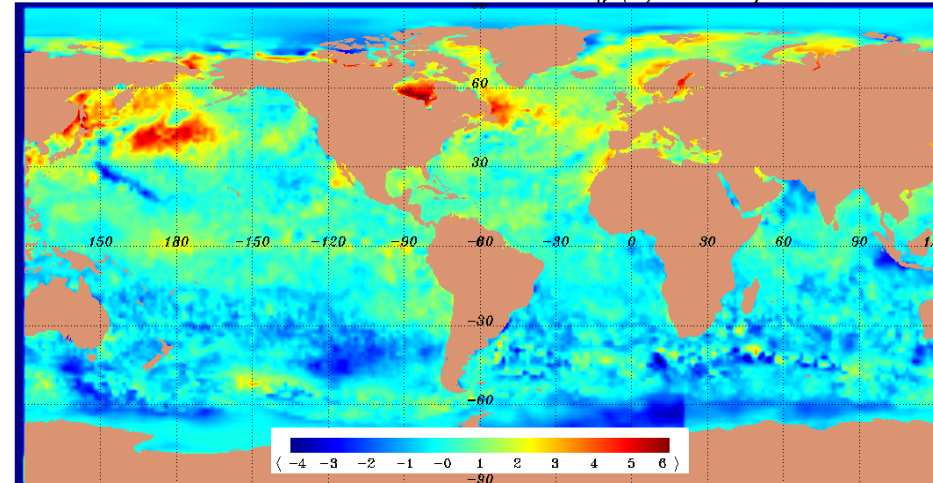
# *QC/Data Preparation Accomplishments*

A.  Creation of hourly t-files and fgge files for CAAPS

   -   Align same data with classified obs with same science NAVDAS, NAVDAS-AR, and NAVDAS-AOD versus MVOI.  Align global model radiance assimilation with regional mesoscale functionality. Need coordination with NRL, PMW120, and CNMOC.

B.  Transition to fully understand and optimize CDS solutions.

C.   Implementation of classified observations into NCODA on newly refreshed A2 platforms (COA2) plans.

# *Satellite Data Processing*

A. **Radiances for NWP – AMSU, AIRS, IASI**

B. **Plans for use of Suomi data, transition to new NPP processing platforms.**

B. **Tactical Imagery production for SAT_FOCUS, NEP-Oc integration.**

C. **Tropical Cyclone Tracking – TCWEB, NEP-Oc integration and BFT delivery of MTIFF to JTWC**

# *SATELLITE RADIANCES*
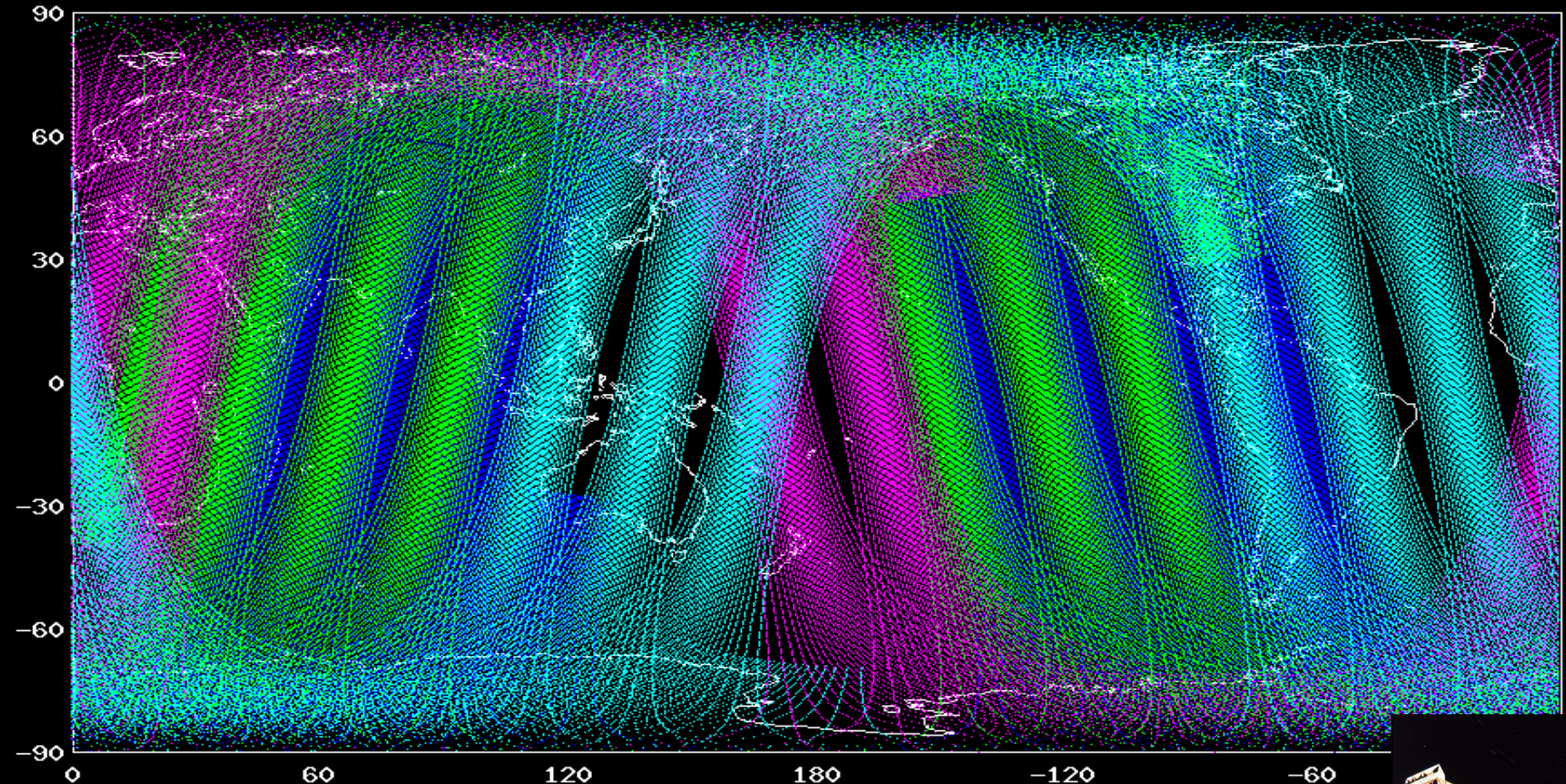
# *Tropical Cyclone Web Page (TCWeb)*

- Multi sensor , data and imagery fusion
- Aids JTWC and NHC forecasters and analysts in determining more accurate storm positions and intensities
- Available to the public

u.l. – GOES IR (color enhance)
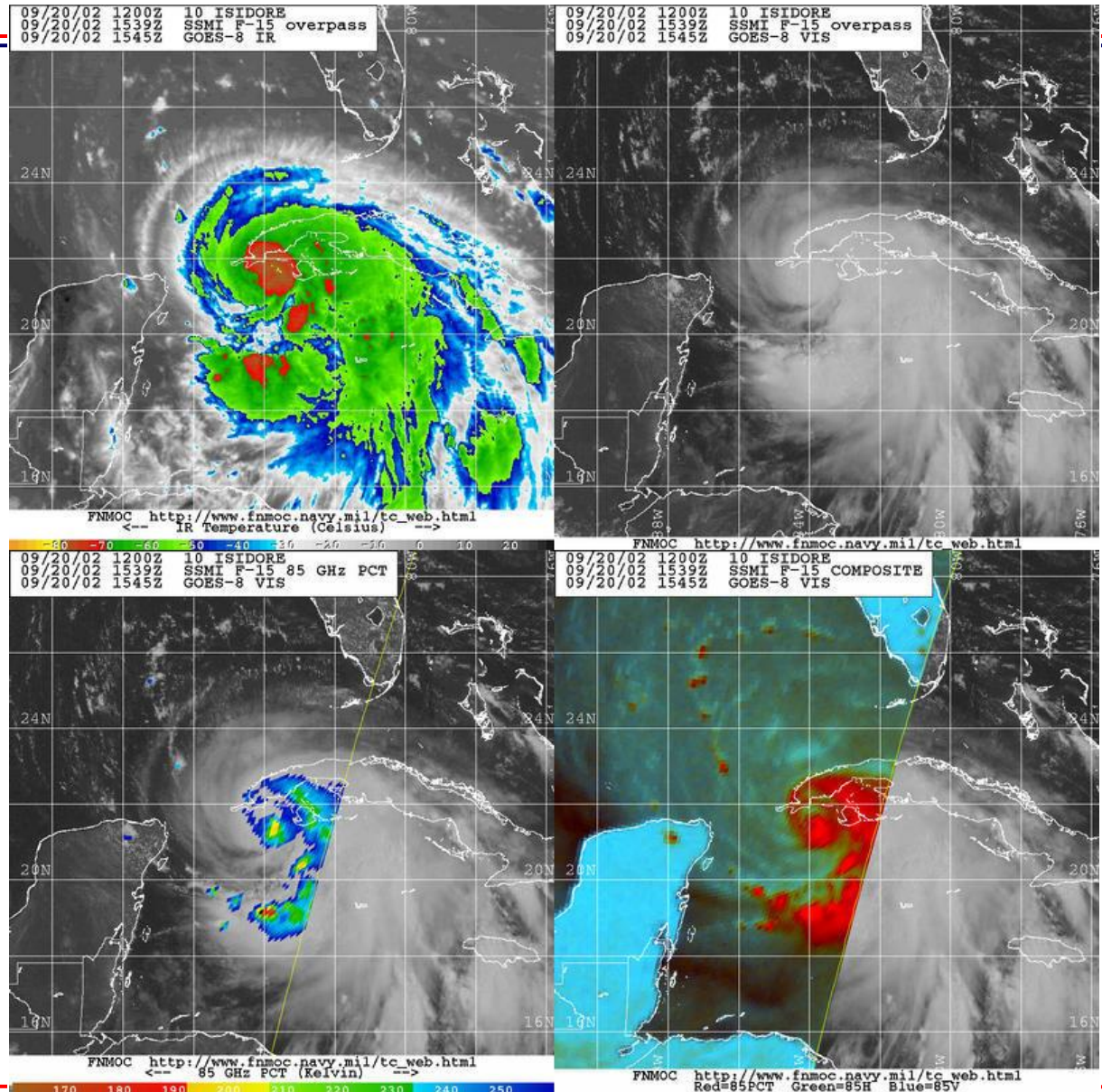
u.r. –GOES VIS

l.l.  - SSMI PCT/ GOES VIS

l.r. – SSMI Composite/ GOES VIS

New data types include AMSR-E, MSG,  AQUA, TERRA, QUIKSCAT, WINDSAT, SSMIS

# SIPRNET Satellite Focus

- FNMOC presentation of operational satellite products

- In response to user request, region specific
  - Arabian Sea, Afghanistan, Persian Gulf
  - Where next?

- MODIS, SeaWIFS true color/dust enhancement, feature tracking winds

- New products – low cloud over snow, low clouds at night, convective cloud top heights

- MODIS dust enhancement over the Northern Arabian Sea, true color over land. Dust over the ocean appears as shades of pink. Dry lakebeds over land (often representing sources of dust) are also indicated in pink.

- Horizontal resolution of the data is 0.5 km.



30 Jan 2002, 0740Z, SeaWiFS true color

MODIS 10/10/2001 0635-Z NRL Monterey
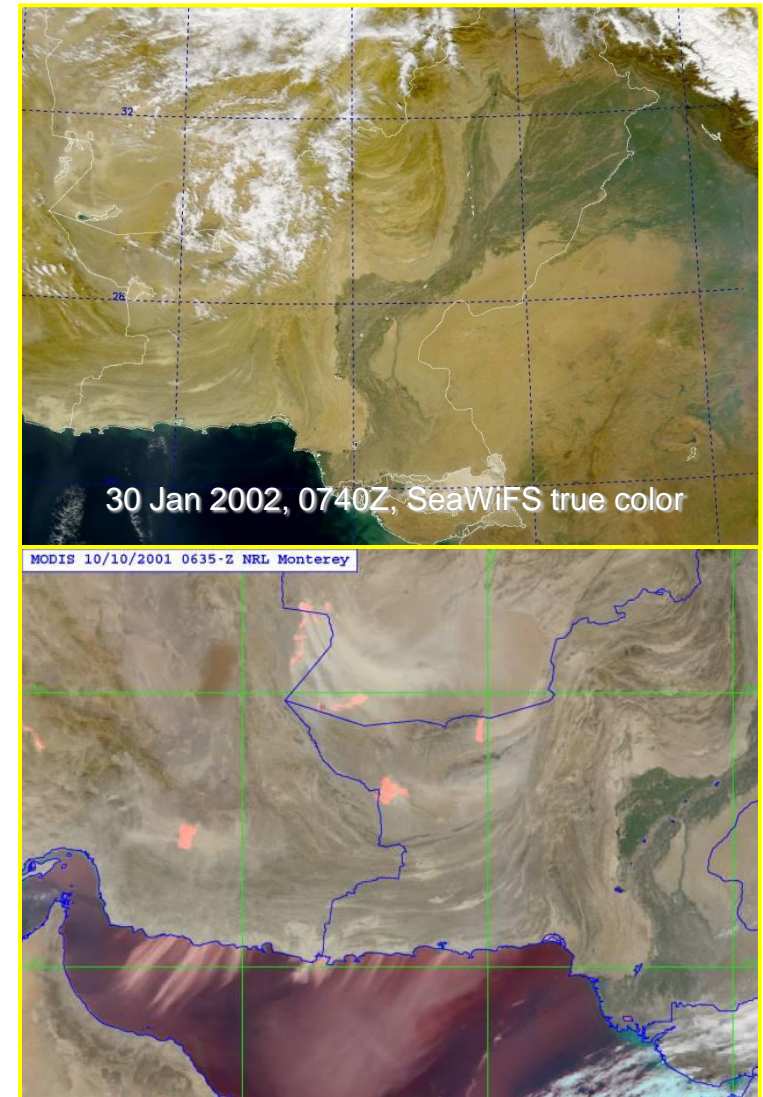
# *Satellite Working On*

New Satellite Data Types

   a.  METOP – 3rd polar satellite in the NPOESS constellation (McMurdo)

   b.  NOAA -  IJPS follow on with METOP C,D,E program
   c.  MODIS, AIRS, IASI, ASCAT, AVHRR 1km – NESDIS via DATMS-U
       - Issue: Bandwidth upgraded needed.
   d.  DMSP F18 – September  2009, UPP data for NWP, cal/val ongoing
   e.  Altimetry – Jason2/Envisat wave height and sea surface height

Satellite Programs

   a.  Defense Meteorological Satellite Program – SSMI/S Cal/Val Team
   - Integrating DMSP ingest upgrade for continued real time backup

   b.  WindSAT  – NRL DC Risk Reduction for NPOESS MIS

   c.  National Polar Orbiting Environmental Satellite System (NPOESS)

   d. FMQ-17 upgrades

   - Issues: Facilities, DQM/E,  NOGAPS/NAAPS ancillary data source
   -  NPP data access and POM10 alignment, IDPS Installation Dates

# *Interagency Support*

- Committee Operational Processing Centers (COPC)
- Cooperative Support and Backup (CSAB)
- Joint Action Working Groups – Acquisition and Assimilation, Communications Management, Modeling
- Joint Center for Satellite Data Assimilation
  - Issues
    - NUOPC concerns
    - MOA – Data Acquisition Processing Exchange (DAPE)
    - Satellite Annex and Satellite CONOPS (TR-1) updates and IA
    - Modeling CONOPS (Navy non-concur on WRF)
    - NPOESS Data Exploitation (backup and functionality)

# Questions?